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SCIENCE NEWS LETTER



®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Laboratory Weeds

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TEXT PREPARED BY MIT SPECIALIST

Dr. Claude Shannon, known to the readers of *Popular Electronics* for his invention of the electronic mouse, that runs a maze, learning as it goes, formerly a research mathematician for Bell Telephone Laboratories is now a research associate at MIT. His books include publications on Communication theory and the recent volume "Automat Studies" on the theory of robot construction. He has prepared a paper entitled "A Symbolic Analysis of Relay and Switching Circuits" which is available to purchasers of the GENIAC. Covering the basic theory necessary for advanced circuit design it vastly extends the range of our kit.

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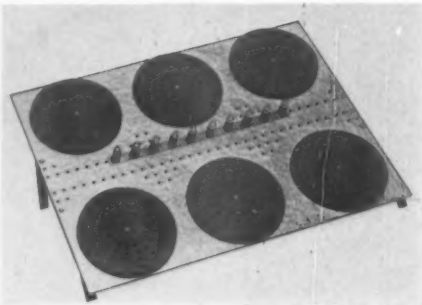
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COMMENTS BY CUSTOMERS

We know the best recommendation for GENIAC is what it has done for the people who bought it. The comments from our customers we like best are the ones that come in daily attached to new circuits that have been created by the owners of GENIACS. Recently one man wrote: "GENIAC has opened a new world of thinking to me." Another who designed the "Machine That Forecasts the Weather" commented:

"Several months ago I purchased your GENIAC and found it an excellent piece of equipment. I learned a lot about computers from the enclosed books and pamphlets and I am now designing a small relay computer which will include arithmetical and logical units . . . another of my past projects in cybernetics is a weather forecaster. I find that your GENIAC Kit may be used in their construction. I enclose the circuits and their explanation." Eugene Darling, Malden.

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- 6) A Machine to Compose Music shows in an actual circuit what other GENIAC owners have been able to do on their own in designing new devices.
- 7) A Machine to Forecast the Weather—again a new adventure in scientific thinking created by one of our users who was trained on his GENIAC Kit.

Plus all the components necessary for the building of over 125 machines and as many others as you can design yourself.

ENGINEERING

Plan Excavation by Bomb

New peaceful uses for atomic bombs include excavating harbors, creating large supplies of radioactive isotopes, recovering oil and restoring depleted water supplies.

► PLANS ARE revealed in the semi-annual report of the Atomic Energy Commission for gigantic uses of nuclear explosions, including excavating harbors, creating large supplies of useful radioactive isotopes, recovering oil from oil shales and tar sands; restoring depleted water supplies, and discovering new facts about the earth.

Most imminent use of atomic bomb explosions for excavation on a grand scale is to make a harbor in northwest Alaska where one does not exist. Survey teams are now in the area between Cape Sepings and Cape Thompson, north of the Arctic Circle, determining whether the ocean currents would usefully fill a blasted hole in the coast, whether the radiation created would be dangerous, and whether the mineral resources in the area justify such a large-scale development.

While the underground nuclear "Rainier" explosion of last Sept. 19 was announced as a weapons testing method to eliminate fallout, its experience aids this current program, known as Project Plowshare.

Oil may be obtained through underground nuclear explosions from two untapped sources, oil sands and tar sands. The heat of atomic explosions could be used to separate underground the oil from the shale and allow it to be pumped. Similarly, the gummy tar materials trapped between im-

pervious rock layers could be so lowered in viscosity as to be extracted. Immense beds of these oil-bearing materials exist in both the United States and Canada.

Another idea is to bury an atomic bomb in a large subterranean salt deposit and surround it with substances to be made radioactive by neutrons produced, thus giving supplies of needed isotopes for industry, medicine and research.

A device for studying the possibilities of harnessing usefully the immense power of the H-bomb was detailed in the AEC report, which brings together progress achieved in producing power from controlled fusion. Called the homopolar device, it was built at the University of California's Radiation Laboratory at Berkeley. It gives promise of showing how to create and confine a thermonuclear plasma of millions of degrees of temperature which would be necessary in fusion power.

The benefits of a fusion reactor fueled with heavy hydrogen if operated successfully some day as set forth in the report are: Fuel costs would be low; fuel supply would be virtually unlimited; fusion power-plant would be extremely safe; radioactive hazards would be low and plant efficiency may be high.

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Reports from as many different locations as possible are needed, including ships at sea, remote military outposts, etc., for maximum geographical coverage. Occasions are cited when observers at high latitudes have heard sputnik signals continuously during several complete trips around the earth.

Inquiries should be addressed to Satellite Ionospheric Observations, ARRL, West Hartford, Conn.

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GEOPHYSICS

Explorer IV Designed To Detect Radiation

► THE FOURTH and heaviest United States satellite was launched at 11 a.m., Saturday, July 26.

The 38.4-pound, 80-inch long satellite, which carries some 18 pounds of instruments, is expected to make more accurate measurements and an analysis of a layer of powerful radiation that has been found to surround the earth. This investigation is directly related to the effects of cosmic radiation on future space travelers.

The low point in the satellite's orbit, which is a very large elliptical one that carries it over parts of the U.S.S.R., is 177 miles; the high point is 1,368 miles. It circles the globe once every 110 minutes.

Smithsonian Astrophysical Observatory scientists made one of the early sightings of Satellite 1958 Epsilon, as the "moon" is called, by telescope.

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GEOPHYSICS

"Hams" Tune in on "Moon"

► AMATEUR radio operators throughout the world are being asked to tune in on sputnik signals. The object of this worldwide listening is to accumulate specialized ionospheric data which cannot be obtained from U. S. satellites.

The only Russian satellite still aloft, Sputnik III, transmits on 20.005 megacycles. A similar signal is often heard on 40.01 mc., but this is believed to be a harmonic of the other.

The amateurs are being enlisted by the U. S. National Committee for the International Geophysical Year through the American Radio Relay League of West Hartford, Conn. Amateur help is needed, the ARRL says, because there are not enough professional observatories in existence to do the job.

Data being sought fall into three categories:

1. Measurement of the Doppler effect to determine bending of the signals by the upper atmosphere.

2. Determination of minimum-usable frequencies (20 or 40 mc.) by noting times of

appearance and disappearance of sputnik signals.

3. Measurement of signals when satellite is out of sight of observer to determine long-distance propagation effects.

The effects to be measured are easily noticed at sputnik frequencies, but considerably less pronounced on Explorer and Vanguard wavelengths.

The ARRL explains that almost any amateur who wishes may take part in the program. Much, however, depends on the quality of the amateur's equipment.

The first category, for example, requires highly accurate frequency-measuring gear, probably available to relatively few amateurs. The second and third categories, on the other hand, require only a radio receiver capable of being tuned to 20 and 40 mc., and selective enough to reject other signals in the immediate vicinity.

Tape recording of the signals is suggested but each amateur is urged to analyze his own taped observations. Forms will be sent to the observers for this purpose.



URANIUM—This plastic model of a uranium crystal is unique in that it shows placement of the atoms at temperature conditions never before simulated in model form. Studies of such crystals are being made at the General Electric Company's Richland, Wash., laboratory to increase understanding of what happens to the crystals undergoing the intense heat inside a nuclear reactor.

ARCHAEOLOGY

Iraq Study Stopped

► THE KILLING OF KING FEISAL II and the fall of his Government in Iraq interrupted study of the causes for the fall of the Sumer Government in the same area thousands of years ago.

An important cause of the ancient fall of Government was traced to farming methods. Prof. Thorkild Jacobsen of the Oriental Institute, University of Chicago, working in cooperation with the Directorate General of Antiquities of Iraq under the Feisal Government, reported.

Over-irrigation led to the depositing of mineral salts on the soil to such an extent that crop yields were reduced sharply.

From carbonized remains of grain and grain imprints in bricks used for buildings, the archaeologists learned that the principal crops were wheat and barley. As the land became more salty, Sumerian farmers had to switch from wheat to the harder barley. But later as more and more salt was deposited, barley crops also dropped off.

At the peak of production, the best Sumerian fields yielded more wheat per acre than the best Canadian fields today.

But by the time wheat disappeared completely in southern Iraq because of salting, the center of civilization shifted to the north, where Babylon began to emerge under Hammurabi.

As part of their study, Prof. Jacobsen and his party excavated parts of two cities in the area and an ancient irrigation canal, the Naharwan. On the Naharwan canal the expedition found a weir, a type of dam, used in early Moslem times to raise the water level for irrigation. Dating from the early 8th century, the weir raised the waters in front of it about nine feet, furnishing water for 11 branch canals. It contained a spillway, two flanking abutments, two frontal guide banks and two water regulators. There were sluices at the heads of each branch canal so that the amount of water to be used for irrigation could be regulated exactly.

The study was undertaken to guide Feisal's Iraqi Government before it embarked on an extensive land reclamation project.

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poured into the fight against the cripplers, the hope grows that more may be learned about the diseases and better treatments may be found or made.

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RADIO

Saturday, August 16, 1958, 1:30-1:45 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Mr. Bart Spano, chairman, Civil Aeronautics Jet Planning Group, will discuss "The Jet Transport Era."

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MEDICINE

Fight Against Cripplers

► THE SAME huge resources that have waged the successful battle against the child crippler, poliomyelitis, are being turned toward another group of crippling diseases, which affect adults as well as children.

The announcement by the National Foundation for Infantile Paralysis that the public donations given to the March of Dimes (about \$35,400,000) will go to the fight against arthritis and rheumatic diseases as well as other diseases, lends hope that these age-old cripplers are on their last legs.

Added to the funds of the National Institute of Arthritic and Metabolic Diseases, about \$3,500,000, and the Arthritis and Rheumatism Foundation, about \$500,000, there is expected to be a tremendous increase in research against these diseases.

Arthritis and rheumatism have plagued mankind since time immemorial, and little has been done until recently, with one important exception, to treat its aggravating, painful symptoms.

Formerly, arthritis, which has at least 30 different forms, was one of those human afflictions for which doctors could do little more than try to make the patient comfortable and hope for the best.

Only in the case of gout has there been a useful drug for the relief of pain and other symptoms. That drug, colchicine, has been in use for about 400 years.

The discovery of cortisone within the past decade has set the wheels of research rolling in high gear against all kinds of arthritis and rheumatism. No longer are physicians shrugging their shoulders hopelessly.

Nearly 12,000,000 Americans are afflicted

with these diseases. Of the victims, about 218,000 are completely disabled, 1,500,000 are disabled part of the time, and the remainder are subjected to chronic or recurring pains.

The worst of the arthritic and rheumatic diseases is known as rheumatoid arthritis and affects the joints, making the simplest movements unbearably painful. As with the other types, the cause is unknown.

Osteoarthritis is referred to as a degenerative disease. It attacks mostly older people and, according to some authorities, nobody can escape it if he lives long enough. Similar to, and more common than rheumatoid arthritis, osteoarthritis is the less damaging of the two.

Another group of arthritic diseases is that affecting the soft tissues, such as muscles, nerves, and ligaments. They go under the familiar names of bursitis, neuritis, sciatica, and lumbago.

Many of the arthritic diseases last a lifetime and generally are not fatal. There is, however, a kind of related grouping known as collagen disorders which attack and destroy the connective tissues (such as tendons and cartilage) and often kill the victim.

The effects of arthritis and rheumatism are more than painful to the sufferers. The diseases often cause impoverishment to the victim and his family. His treatment may be expensive and he may not be able to work.

It is estimated that the diseases cause the loss of about 150,000,000 work days each year, and the loss of more than \$500,000,000 during the same period.

As more funds and more research are

MEDICINE

Law Segregates Blood

Scientifically, no way exists to distinguish blood of one race from that of another. Yet a new state law requires segregation of blood.

► LOUISIANA state law now requires segregation of blood that will be used for transfusion. The new Louisiana law went into effect on July 30.

The citizens of Louisiana need not fear a shortage of their blood supply in case of local catastrophe, however. The blood-segregation bill has a clause to the effect that the legislation does not apply in disaster areas or in individual cases where the physician decides that an emergency exists. In these extreme cases, presumably, any blood will be acceptable.

If Louisiana continues to rely on its own commercial and hospital centers for its blood supply, compliance with the law may be possible.

The American National Red Cross recently canceled its only contract in the state. It had been supplying some of the blood for the Veterans Administration Hospital in New Orleans. The decision to cancel the contract had nothing to do with the new legislation, however. It was made before the legislation was passed and signed by Governor Earl Long.

The Veterans Administration is now studying the law to determine what effect it will have on the three VA hospitals in Louisiana. The segregation law may affect the Federal law that enforces non-discrimination and non-segregation of patients in the hospitals.

If the VA hospitals in the state have to

rely on blood donated to them from within Louisiana, as for the most part they now do, they may be subject to the segregation law.

If some of the blood is supplied to the Veterans Administration from sources other than those within Louisiana, it will be difficult to comply with the law because the blood would have to be identified at the time it is donated. This is impossible if the area of the source of supply does not label blood according to race.

Anthropologists agree there is no way of distinguishing a Negro's blood from that of a white person. No harmful effect results from transfusing blood from one race to a person of another race.

Of course, if whole blood is used, the usual precautions must be taken to use blood of the same blood group or one which is compatible. In general, doctors prefer to use a donor from the same family if possible.

Negroes have the same blood groups as whites, only the relative proportions differ. Negroes have a somewhat higher proportion of blood group B and less of the dangerous Rh negative.

If the policy of segregating blood is practiced, the chances are that there will be fewer white donors than Negro donors, due to the economic reward that encourages the Negro to donate. The greater demand will probably arise for "white" blood since white

persons can be expected to be better able to pay for blood. Thus, "white" blood may be scarce, while Negro blood piles up.

Furthermore, strict observance of the correct tagging of each pint of blood will be necessary since, once the tag is lost, identification by race will be impossible.

The blood segregation bill is the result of the efforts of Louisiana's Joint Legislative Committee on Segregation.

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ARCHAEOLOGY

Find Monument Honoring Dissolute Roman Emperor

► A MAGNIFICENT INSCRIPTION in monumental letters on a marble block over seven feet long and three feet high has been found by American archaeologists in the ancient city of Sardis in Turkey. The inscription honored the Roman Emperor Lucius Verus, dissolute brother of the virtuous and renowned Marcus Aurelius. He reigned from 161-169 A.D.

The find was made by Prof. Thomas Canfield of Cornell University in the ruins of a great building. The expedition, of which Prof. G. M. A. Hanfmann of Harvard is field director, is sponsored by Cornell University, Fogg Art Museum of Harvard, and the American Schools of Oriental Research, with the support of the Bollingen Foundation of New York City.

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MEDICINE

Doll House Aids Patients As Therapeutic Device

► A SIX-ROOM doll house has become a successful therapeutic device at an Albany Veterans Administration hospital in Albany.

The completely furnished doll house is being used to rehabilitate aphasic patients, those who have lost their power of expression by speech, writing or signs, or of comprehending spoken or written language, due to injury or disease of the brain centers.

One of the problems confronting the therapist who is treating the aphasic patient is how to teach the patient to recognize similarities and differences. This can be accomplished by encouraging the patient to group materials, Dr. Joshua Ehrlich and Jeanne C. Cook of Albany, report in the *Archives of Physical Medicine and Rehabilitation* (July).

The doll house and its furniture provide a less cumbersome group of common materials. The patients learn to assemble furniture according to the needs of each room. As they progress, they learn to identify each piece by name.

The doll house equipment can probably be used in many other ways. Auditory training can be provided by giving commands involving any number of these small objects. Visual retention can be drilled and visual orientation, and hand-eye placement can also be improved with the aid of these mobile objects.

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MISSILE PLATFORM—This new, long-range, eight-jet Boeing bomber will serve as a launching platform for supersonic, air-to-surface "Hound Dog" missiles. The aircraft is described as one of the U. S. Strategic Air Command's newest weapons; its increased range will allow the 450,000-pound Strato-fortress to span oceans and return to United States bases without refueling.

EVOLUTION

Study Primate Evolution

► **COUNTING HOW MANY** chromosomes a monkey has may help place it in the time-scale of evolution.

Improved laboratory techniques for growing cells and studying the tiny chromosome found in the cell nucleus have now made possible accurate determination of the number and "looks" of these microscopic carriers of heredity.

With this information scientists may be able to solve some of the puzzles in classifying primates according to which one evolved first. So far the study of anatomy has left many gaps in understanding the relationships among this important group of animals.

Experiments with some ten different monkeys representing eight genera of primates are reported by Drs. Michael A. Bender and Lawrence E. Mettler of Johns Hopkins University biology department in *Science* (July 25). Their research includes the first reported chromosome count for an early primate, called a slow loris.

From the more than 30 good chromosome studies obtained from each species the scientists were able to make both drawings and photographs of the chromosomes.

A large variation in chromosome number

exists among the primates, the scientists report, as the numbers range from 34 to 66. However, examination of the chromosome shapes points to central fusion as one way the chromosome number has evolved from species to species.

In four species, including the cinnamon ringtail, a red titi, a squirrel monkey, and a hooded spider monkey, the most highly specialized monkey in the family has the fewest chromosomes.

If, in the course of evolution, chromosomes fused together, this would account for the progressively lower number in more specialized species. Particularly interesting, the scientists report, is the observation that the spider monkey, which is better adapted for living in trees, had the greatest number of chromosomes that fused at the mid-point. This indicates fusion would have taken place in the middle of the two chromosomes.

"Although the studies of the chromosomes of the primates which have been made to date have only scratched the surface, so to speak," the scientists concluded, "it is already obvious that such studies can be of great help in the analysis of the problem of the evolution of this group."

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PUBLIC HEALTH

A-Stockpile "Unclean"

► **AMERICA'S** defense forces admittedly are stockpiling nuclear weapons that are "dirty," but not "salted."

The question of whether the weapons are stockpiling are really "dirty" is still open to debate, and persons who have different definitions of "dirty" bombs will take different sides of the issue.

Defense Secretary Neil H. McElroy's recent letter on the subject to Sen. Richard B. Russell (D.-Ga.) states that our armed forces do not recognize the word "dirty," but admits a growing stockpile of unclean nuclear weapons.

The letter, which confirmed development of a new bomb fuse to trigger the weapons at ground level, admitted that some of our unclean nuclear weapons will be even less clean in actual use.

Although the Secretary of Defense denied we have considered making deliberately "dirty" weapons, the full text of the letter shown to newsmen three days after part of its contents were "leaked" on Capitol Hill suggests we are interested in the science of "dirty" weapons from the standpoint of self-preservation.

Secretary McElroy said he had requested the Atomic Energy Commission to "determine whether it is technically feasible to design" dirty atomic weapons for two reasons:

1. "We should like to know whether an enemy might be able to design and use such weapons against us.

2. "We visualize certain situations under which it might be highly desirable to deny the enemy the use of certain facilities and/or areas for a limited period without causing wholesale destruction."

A high Pentagon official told *SCIENCE SERVICE* he doubts that an enemy would ever use a "dirty," or "salted" bomb against us because "it probably would cause him as much harm as it would us."

The Department of Defense recognizes three types of nuclear weapons, with respect to their cleanliness:

1. Normal weapons which are similar to the first atomic bombs, but larger. These are primarily fission weapons and release large amounts of radioactivity into the atmosphere. We continue to stockpile them, Mr. McElroy said, because they have their specific uses.

2. "Salted" weapons which have been made deliberately "dirty" and are designed to cause death and sickness through radiation as much as they are designed to destroy military objectives.

3. Clean bombs. These are fusion weapons, such as hydrogen bombs, which are five percent "dirty" and 95% clean due to the nature of fusion reactions.

One of the Atomic Energy Commission's most bitter critics on the dirty bomb versus clean bomb issue, Sen. Clinton P. Anderson (D.-N.M.) told *SCIENCE SERVICE* "I am glad to see they now acknowledge they are continuing to stockpile normal 100% fis-

sion, or 'dirty,' weapons along with the cleaner hydrogen bombs."

Sen. Anderson said he saw no objection to unclean fission bombs, but felt the Atomic Energy Commission had misled the public into believing that all our nuclear weapon production recently has been devoted to so-called "clean" bombs.

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CHEMISTRY

Tektites Come From Beyond Solar System

► **TEKTITES**, GLASSY OBJECTS found in widely scattered groups around the world, come from somewhere in the vast regions of space beyond the solar system, according to a new theory.

If so, tektites are the only material available for study on earth showing the composition of matter formed elsewhere than in the solar system. Further study of their chemical make-up could give experimental verification of the theory on the origin of tektites, proposed in *Nature* (July 26) by Dr. Truman P. Kohman, now at the Max-Planck-Institute for Chemistry, Mainz, Germany.

Dr. Kohman bases his theory on the high levels of radioactivity he and Dr. W. D. Ehmann found in certain tektites while working at the Carnegie Institute of Technology, Pittsburgh. The radioactivity, caused by cosmic ray bombardment, of aluminum 26 and beryllium 10 was measured "considerably above any conceivable levels of production by cosmic or terrestrial radiations at or beneath the earth's surface."

This finding virtually eliminates not only the earth but also the moon as the source of tektites. Dr. Kohman suggests tektites arrived at the earth's surface as a loose cluster of glassy objects from outside the solar system.

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GENETICS

Chromosomes Affected By "Medium" Radiation

► **A "MEDIUM" DOSE** of radiation may be more dangerous to a living organism than a high dose.

J. S. Kirby-Smith and G. W. Dolphin of St. Bartholomew's Hospital Medical College in London, England, noted a "definite and significant decrease" in the frequency of chromosome breaks and exchanges when a spiderwort plant was subjected to higher dose rates of radiation.

At present, they report in *Nature* (July 26), there is no satisfactory explanation of the 40% to 50% drop in chromosome aberrations or changes that follows intense irradiation.

They suggest that they may be due to a partial, temporary anoxia resulting from the immediate consumption of oxygen under intense bursts of radiation.

Their studies were made with microspores of the spiderwort plant, *Tradescantia paludosa*.

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PUBLIC HEALTH

Hay Fever Season Due

► **HAY FEVER** sufferers should prepare for their seasonal bout with ragweed from mid-August to mid-September, when the pollen count is highest.

Several million Americans are already well-stocked with anti-ragweed ammunition, tissues, inhalers, nose drops and antihistaminics, in anticipation of the coming hay fever season. Some have begun to experience the familiar symptoms of sneezing, nasal discharge and weeping eyes.

But many others have not yet begun to suffer seriously because, in most parts of the country, the peak of the season occurs during late summer when ragweed pollen fills the air, the Allergy Foundation of America has pointed out.

What can victims do in preparation of the season that is fast approaching? The Foundation advises these procedures:

1. Begin taking anti-hay fever shots well before the onset of the hay fever season. Continue them through the entire season.
2. Avoid exposure to pollen as much as possible. Air condition the home and place of employment.
3. Antihistaminic drugs can be taken to relieve the symptoms. These drugs lessen

the nasal and sinus congestion and relieve itching.

4. For the very sensitive victim, the dust-free room is the best haven.

5. Avoid trips into the country during the high pollen count season.

6. Watch the local communication mediums for the latest pollen count in the area in which you live or must travel.

The pollen index figure for each community is based on three factors that directly affect individual pollen exposure. First, the length of the season; second, maximum aerial concentration of pollen; and third, the total pollen catch on test slides throughout the season.

Any city having a pollen index above ten (and few during the coming weeks will not) is sure to be a trouble area. A count between five and ten is fairly good, while below five is good and a count below one is the hay fever sufferer's paradise.

The heaviest concentrations of pollen occur in the central states, the Mississippi Valley area. The best refuges are the Southern tip of Florida, the Pacific coast, and the wooded areas of northern Minnesota, Michigan, Maine and New Hampshire, a report

issued by the Abbott Laboratories of North Chicago said.

A booklet entitled "Hay Fever and What You Can Do About It" has been prepared by the Committee on Public Education of the Allergy Foundation of America. It contains the advice of leading allergy specialists in the United States. The booklet may be purchased for 25¢ in coin by sending a request to the Allergy Foundation of America, 801 Second Ave., New York 17, N. Y.

Science News Letter, August 9, 1958

GEOGRAPHY

Addition of Alaska Changes U. S. Center

► **THE ADDITION** of Alaska as the 49th state will shift the geographical center of the United States approximately 439 miles northwest, Rear Admiral H. Arnold Karo, director of the Coast and Geodetic Survey, reported.

The new center will be some 11 miles west of Castle Rock, S. Dak., or 20 miles east of the corner where South Dakota, Wyoming and Montana meet. Now the center is near Lebanon, Kans.

Survey scientists point out that because there is "no great degree of precision" in the methods used to determine the geographical center, the point, given as latitude 44 degrees, 59 minutes north and longitude 103 degrees, 38 minutes west, may be "off" as much as ten miles in any direction.

Center of gravity methods were used to compute the new position. Admiral Karo describes the method as follows:

"If one imagines a weightless spherical shell on which the areas of only the United States and Alaska are painted with an absolutely uniform thickness, then the center of gravity, or the geographic center, might be said to be that point at which the shell will balance."

Science News Letter, August 9, 1958

NATURAL RESOURCES

Predicts Bright Future For Seaweed Feed

► **SEAWEED**, with its exceptionally high vitamin content, may one day soon provide food for man and animals.

Experiments indicate that livestock gains many benefits from being fed seaweed meal. Milk production increased in cows and the vitamin A content of their milk was greater. Sheep produced more lambs and pelts of unusual quality. Hens laid better eggs, turkey mortality was reduced and pigs fattened faster.

Seaweed is the only known vegetable source of vitamin B-12 and is a very good source of carotene, vitamin B-1, vitamin E and folic acid. It contains about the same amount of fat and protein as plants grown on land.

Seaweed may also be useful as a fertilizer to return minerals to the soil, the U. S. Fish and Wildlife Service reports in *Commercial Fisheries Abstracts*.

Science News Letter, August 9, 1958



ACCELERATOR COUNTER—Test trials have begun on the Midwestern Universities Research Association's electron accelerator, forerunner of the world's largest atom smasher. Shown checking the machine's electron counter are physicists R. O. Haxby (left) of Purdue University and Fred Mills of MURA. The model has unique spiral-shaped magnets. MURA headquarters are at the University of Wisconsin.

METEOROLOGY

Method Improves Temperature Forecasting

► A NEW METHOD of predicting temperatures five days and 30 days in the future greatly increases the accuracy of such forecasts.

The method is sufficiently simple so that anyone given the proper instructions in using an electronic computer can make the temperature forecast. The results as taken directly from the machine are as accurate as the five-year average of temperature predictions made by previous methods, which involved use of all possible corrections. And the untampered results from the machine can then be further improved by additional corrections.

The probability that the highly accurate temperature predictions made in the last eight months through use of the system are due to chance is only three in 10,000, Jerome Namias told SCIENCE SERVICE. Mr. Namias is chief of the Weather Bureau's extended forecast section in Suitland, Md.

The method is described as "objective" because all information is calculated according to certain formulas. The weather forecaster's subjective, or personal, opinions do not affect the prediction.

With the increasing use of electronic computers, weathermen are relying increasingly on objective methods of predicting weather over large areas. Local forecasters, however, still must rely on their personal knowledge of conditions in their area in making predictions for limited regions.

Science News Letter, August 9, 1958

MEDICINE

Suggests Way to Prevent Fatal Heart Blowout

► A WAY TO prevent fatal blowouts of the heart has been suggested through a new concept of the steps leading to such an occurrence.

Dr. Walter J. Freeman of the University of California at Los Angeles Medical School has advanced the new concept in *Archives of Pathology*, published by the American Medical Association, following a study of the hearts of 36 patients who had died of a myocardial rupture.

Dr. Freeman found the blowout, occurring in the heart muscle wall, had been preceded in most cases by development of a series of tiny infarcts, areas of tissue death resulting from diminished blood supply through narrowed arteries.

These small infarcts commonly occur three to seven days before the blowout and result in local weakness in the heart's inner wall.

Just prior to the blowout, as was previously known, a blood clot lodges in a narrowed heart artery, causing a large area of tissue death surrounding the tiny infarcts. Like a damaged tire tube this area of the heart wall bulges and blows out.

Patients had reported symptoms, some

severe, apparently caused by the tiny infarcts, Dr. Freeman says. It has also been noted that small infarcts cause a slight change in the electrocardiograph pattern.

If the patient is treated with anticoagulants as soon as first signs of tiny infarcts appear, clots may not form and the blowout may be prevented, he believes.

Dr. Freeman, a U. S. Public Health Service Postgraduate Fellow at UCLA, initiated the study at Yale University Medical School. He was recently awarded the Oliver Douglas Memorial Award by the Los Angeles County Heart Association for an essay on this topic.

Science News Letter, August 9, 1958

BIOLOGY

Russians Denounce Own "New Cell Theory"

► SOVIET BIOLOGY is being subjected to scathing criticism by two of their own scientists, according to a translated report in *Science* (July 25).

In contrast to the commonly accepted theory of how cells evolve, originated by the Germans, Schwann and Schleiden, more than 100 years ago, the new theory claims cells develop from acellular "living substance." The development of "true living cells" from crystal-like structures in cultures of egg white, as described by O. B. Lepezhinskaya, is an example of the new theory.

The generally accepted theory states that cells develop from other cells which in turn are the units of living matter.

The Russian critics object to Lepezhinskaya's cell theory because it is "not founded on solid, firmly established facts and, consequently, does not reflect any laws actually existing in nature." Her hypothesis, the Russians say, can only claim "to depict the personal, subjective views of her and her supporters."

None of the attempts of other scientists to prove the proposed theory have been successful, critics L. N. Zhinkin and V. P. Mikhailov of the Moscow Oblast Scientific Research Institute of Obstetrics and Gynecology report. All the research reaffirms the "old" cell theory.

Despite the fact that Russian scientists, including Trofim Lysenko, have gone along with the new theory and that, by order of the U.S.S.R. Academy of Sciences, the theory is being taught in schools, Mr. Zhinkin and Mr. Mikhailov condemn the theory as "speculative hypotheses, linked with a quite primitive understanding of biogenetic law."

Until recently, critics of the new Russian theory have been described as reactionaries in science along with the metaphysicists and idealists.

As more evidence piles up pointing to inaccuracies in the new cell theory, and is published, the new theory may be thrown out. Russian scientists may be obliged by the facts to return to the old western theory of the cell.

The critical review is translated by the Pergamon Institute for the Russian scientific translation program of the National Institutes of Health, Bethesda, Md.

Science News Letter, August 9, 1958

IN SCIENCE

TECHNOLOGY

Australian Process Gives Pants Permanent Crease

► EVEN WHEN IT RAINS "down under," Australians will be able to keep their trousers creased and their skirts permanently pleated, thanks to a new wool treatment process.

A dilute chemical solution followed by setting desired creases with steam is involved in the process invented by Dr. A. J. Farnworth. Treated garments keep their creases during prolonged use and drycleaning and will "remain sharp even after wetting with water." The method of applying it is said to be simple, costing about 13 cents a garment. Finished garments need little or no pressing after drycleaning.

Dr. M. Lipson of the Commonwealth Scientific and Industrial Research Organization's (CSIRO) wool textile research laboratories and Dr. Farnworth recently demonstrated the process in New Zealand where it is expected to be used by the garment trade.

Science News Letter, August 9, 1958

ELECTRONICS

Race Bets Computed in Three-Hundredths Second

► THE AMOUNT of money won on a race track bet is computed automatically and accurately in three-hundredths of a second.

The American Totalisator Company's parimutuel installation at Roosevelt Raceway, Westbury, N. Y., demonstrated the mathematical calculations involved in a two-dollar bet. Prof. John R. White, professor of civil engineering at New York's City College, showed the apparatus to mathematics students and the press.

About three billion dollars in wagers are now being placed annually through parimutuel machines in 25 states and in Canada, Mexico and Puerto Rico. These wagers are all registered and computed with the automatic machines, each of which costs a million dollars.

Hundreds of bets on eight different horses and at different prices, from two dollars to \$100, are handled by the equipment virtually simultaneously. The computers, which receive the various bets, store them and then relay them on to the American Totalisator's automatic odds analogue computer.

The "tote machines rarely make mistakes. The machines are adjusted to deduct the state's percentage, usually about ten percent, and the track's share from the total pool when they make the final computations. Racing fans are thus wagering among themselves.

Science News Letter, August 9, 1958

CE FIELDS

PSYCHIATRY

Half of Suicides Had Given Advance Warning

► DOCTORS need to rid themselves of the myths that the person who talks about suicide never carries out the threat and that suicide is always the act of an "insane" person.

This warning, based on study of 140 suicides in the state of New Hampshire during 1955 and 1956, was given the American Psychiatric Association meeting in San Francisco.

Half of those suicides had given suicidal warning either by threatening to take their own lives or by actually attempting it, yet only about one-fifth had ever been under any form of psychiatric care.

It should be possible legally to put the suicidal patient under psychiatric observation entirely on the responsibility of the physician, Dr. David J. Vail, assistant superintendent of the New Hampshire State Hospital, told the meeting.

Of the suicides who had been hospitalized, half were psychotic and one-third had signed themselves in voluntarily.

"But the alcoholic, or immature character type, flirts openly with suicide over a long period, and the psychoneurotic patient has highly elaborate ways of covering up," Dr. Vail said.

"An unknown number of cases are evidently free from any detectable symptomatology, and arrive at their decision with complete rationality."

On the other hand, no one knows how many people threaten suicide or brood on it, and eventually die of something else. The physician should be provided with techniques for recognizing the psychotically depressed patient. The medical practitioner stands at the front line in the battle against suicide and it is only through him that the psychiatrist can exert any measure of control.

Science News Letter, August 9, 1958

DEMOGRAPHY

Latin America Soon to be 2nd Most Populous Area

► BY THE YEAR 2000, Latin America's teeming millions may be exceeded only by those of Asia.

This is revealed in a report by Robert C. Cook, director of the Population Reference Bureau, to the *Population Bulletin* (Aug.), published in Washington.

If the present growth trend continues to the end of the century, Latin America will have almost twice as many people as the United States and Canada. They will have 593,000,000 against our 312,000,000 while Asia will have 3,900,000,000, remaining in first place.

Today, Latin America has the most rapid population growth of all the major regions

of the world. In 1920, Latin America had 91,000,000 people, five percent of the world's population. By 1956, the population there had jumped to 187,000,000, or seven percent of the world's population.

Latin America is a region of youth; children under 15 years of age make up more than 40% of the population in most Latin American countries.

Latin America has comparatively few at the other end of the life span. Less than seven percent of the people are 60 years of age and older except in Argentina and Uruguay. In the U. S., 13% of our people are 60 years old or older while only 30% are under 15.

The report on Latin America as a rapidly growing region of youth was written by Annabelle Desmond and based on a research report by Sarah Lewit.

Science News Letter, August 9, 1958

EVOLUTION

Ability to Make Ascorbic Acid Related to Evolution

► THE FACT that you need a daily dose of vitamin C should please you: It is another piece of evidence indicating that man has a high place in the scale of evolution.

Virtually all animals except primates and the guinea pig are able to make their own ascorbic acid or vitamin C. Apparently, two Indian scientists report in *Nature* (Aug. 2), the capacity to synthesize this very important vitamin has been lost in the high animals.

R. N. Roy and B. C. Guha of the University College of Science and Technology, Calcutta, India, experimented with the vitamin-making powers of amphibians, reptiles, various kinds of birds, and mammals, including the Indian fruit bat.

They found that the kidney tissue of reptiles, amphibians, and those birds belonging to a group that evolved early, could make vitamin C. However, in the most recent group of birds, represented by the magpie robin, crow and myna, the liver tissue had this ability. In one of these birds, the redvented bulbul, neither organ could bring about the synthesis of vitamin C.

The fact that the Indian fruit bat could not make the vitamin may be further evidence, the scientists report, that the bat is closely related to primates. In contrast, rat liver can make vitamin C.

Tests showed the enzyme systems involved in making vitamin C, whether in liver or kidney, are identical or closely similar for all species.

The technique of testing laboratory cultures of liver and kidney tissue to see if they produce vitamin C, with D-glucuronolactone as the substrate or building material, together with cyanide, may be a useful device for placing difficult-to-classify animals in the correct evolutionary group.

"In the evolutionary ascent," the scientists conclude, the mechanism for ascorbic acid synthesis "seems to pass from the kidney to the liver and then to disappear also from the liver."

Science News Letter, August 9, 1958

PUBLIC HEALTH

Scientists Make River To Study Water Pollution

► THE PROBLEMS of how rivers become filth-laden and how they can be made clean again may be solved once and for all by a group of Philadelphia scientists who are building their own river "to find out how rivers operate."

Dr. Ruth Patrick and her staff of water biologists at the Academy of Natural Sciences, Philadelphia, will build a "bulldozed" river 150 feet long and six feet wide on a private estate at Paoli, Pa.

The man-made river and the water pollution study program are sponsored by the Manufacturing Chemists' Association, Washington, which has been sponsoring similar projects at the Academy for five years.

Gen. John E. Hull, president of MCA, said "it is hoped the studies being conducted at the Academy will add appreciably to knowledge of what makes a stream healthy or unhealthy."

Dr. Patrick, who invented the Academy yardstick of judging a stream's health by the plant and animal life it can support, said the artificial river will be used by water biologists in much the same way control animals are used by other biologists.

Scientists in other fields, she said, study a specimen from its birth through maturity. Dr. Patrick plans to follow the same plan with the little river.

It will be allowed to develop, naturally, acquire its own plant and animal life, and follow a river's normal life. During this time it will be under constant surveillance to find out what factors make it healthy or unhealthy.

That knowledge may help other scientists to restore the health of "sick" rivers.

Science News Letter, August 9, 1958

BOTANY

Nickel Inhibits Rust Development on Wheat

► A SOLUTION of nickel metal ions may prove to be an effective way of curbing stem rust in both resistant and susceptible varieties of wheat.

Tests with cobalt, molybdenum, copper, manganese and iron showed none of these affect rust development. However, nickel is "very effective in the prevention of rust development" in detached leaves of susceptible varieties of wheat, D. Wang, P. K. Isaac and E. R. Waygood of the University of Manitoba's botany department, Winnipeg, Canada, report. Zinc also had a slight inhibitory effect when used at high concentrations.

The scientists, reporting their results in *Nature* (July 26), believe it "unwise" to state that nickel acts as a fungicide. It apparently slows down the synthesis and breakdown of chlorophyll, according to studies of both green and blanched or white uninfected detached leaves.

Nickel inhibited both germination and growth of the rust fungus, *Puccinia graminis tritici*.

Science News Letter, August 9, 1958

TECHNOLOGY

Baby Reactors Teach A-Energy

First educational atomic reactor "packages" are now available to colleges for training students. Various fields of industry are open to young persons with atomic training.

By NELSON M. GRIGGS

► TO RUN the atomic power plants of the future, colleges are teaching atomic energy, not only out of books, but by having baby atomic reactors in their laboratories.

These machines are complete with uranium and a neutron source, but are what the scientists call "subcritical," that is, they are not self-energetic and "hot," as the bigger atomic furnaces that are "critical," and therefore are a kind of non-exploding atomic bomb.

In addition, the new baby reactors are obtainable for a fraction of the cost of even the cheapest critical reactor. The difference is that a separate neutron source is provided for the "baby" as it does not contain enough atomic material to sustain a chain reaction by itself.

The move to make reactors available to colleges for purposes of education and training was instituted by the Atomic Energy Commission in September, 1956, as part of a program "to increase the supply of engineers, scientists, and technicians for the national atomic energy program and for the growing atomic energy industry." Lewis L. Strauss, then chairman of the AEC, said the purpose was two-fold: to "provide for direct financial assistance in securing equipment and teaching aids, and for a broadening of the Commission's existing program of assistance in the form of loans of certain materials."

The AEC policy has proved a boon to schools faced with growing student demands for atomic instruction in an atomic age but unable to afford reactors costing hundreds of thousands of dollars.

Special "Baby" for Schools

Under the plan, the AEC makes funds available to schools for the purchase of reactors, provided the school can show the need for a reactor in a planned curriculum of educational projects, and also provided the school can guarantee funds for operating the equipment and conducting the required courses. In addition, atomic materials, which, under the law, cannot be owned by anyone but the AEC, will be furnished on a loan basis as reactor fuel.

No funds, however, will be available for incidental costs such as for a new building to house the reactor, etc., nor will the AEC permit subsidized equipment to be used for commercial purposes.

The new baby reactor, designed especially for use in schools, is manufactured by Nuclear-Chicago Corporation, Chicago, Ill. Company officials say that to date 50 schools have made application to the AEC for grants

for atomic education programs, and the company in turn has made definitive proposals to the schools at their request.

Most of these schools will be given the green light, SCIENCE SERVICE learned, with the possible exception of one or two small liberal arts colleges that lack qualified staff members. Even these, however, will probably win limited grants for "pre-atomic" programs involving elementary equipment such as radiation sources, radiation counters, and the like. After a time, perhaps a year, when these schools can show capability improvement, grants for baby reactors will be allowed.

At present, Nuclear-Chicago has received purchase orders for eight units to be delivered to colleges by Sept. 1 for installation by the beginning of the 1958-59 school year. Most of the units are what the manufacturer calls "full packages" containing all necessary items and instrumentation for conducting a full atomic laboratory program.

Three Prices

Schools may buy the baby reactor in three price ranges:

1. Reactor alone, less accessories, \$10,000.
2. Reactor with basic equipment such as platform, supports, plumbing fixtures, etc., \$13,000.
3. Full reactor package, including all ac-

cessories and instruction manual, \$30,000.

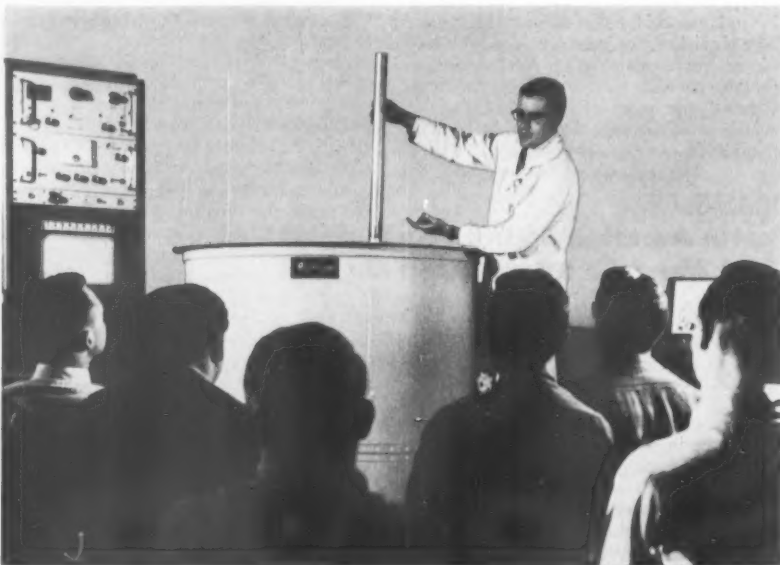
Although the above prices are approximate, based on the particular requirements of the individual college, they run pretty close to actual costs, a company spokesman said, and compare favorably with the least expensive critical reactor which costs in the neighborhood of \$90,000.

Instrumentation contained in the "full package" consists of standard "catalogue items," and accounts for approximately \$17,000 of the package cost. Any school might already own some of these instruments, which would not need to be duplicated, leading to further savings both to the school and to the taxpayer.

Such instruments are standard in industry and by working with them, students will gain knowledge and familiarity that will carry over into professional life.

The instruments include scintillation counters, Geiger counters, portable survey meters, and five- or six-student counter "set-ups," individual instrumentation combinations which enable more than one student to conduct laboratory experiments at one time. The package also includes a unique neutron counter that is placed directly in the heart of the reactor itself and indicates internal atomic activity by means of a remote meter. This device is exclusive with Nuclear-Chicago.

A feature of the package is the instruction manual. Individual instructors, perhaps at a loss to devise adequate training projects for individual students, will find a suggested curriculum outlined in the manual, from which he and the student may select appropriate experiments.



BABY ATOMIC REACTOR—An instructor is demonstrating to his class the operation of the "baby" subcritical atomic reactor developed by Nuclear-Chicago Corporation especially for educational and training use in colleges.

The curriculum was carefully compiled from data supplied by university consultants, advanced engineering schools that had built their own subcritical reactors in the past, and from experiments in the manufacturer's own laboratories.

Wide Open Field

Professional opportunities for graduates in atomic energy are wide open, AEC officials say, and are not confined to the nuclear physics field. Not every student will go into industry to run a reactor. But graduates with a background of nuclear training will find open doors as chemists, biochemists, physicists, medical technicians, and many other positions where their knowledge of nuclear techniques is necessary to their working with radioactive materials.

Industry has been slow to make full use of radioactive isotopes. This hesitation is due to two factors: industrial executives have been reluctant to allow radioactive materials to enter their plants, fearing radiation injury to their workers; and, except in the largest plants, industrial firms lack personnel trained in the effective use of such materials.

Manufacturers, however, can save money and make better products through the use of radioisotopes in analytical procedures by trained men who are familiar with such materials and their use.

Medicine, on the other hand, is advanced in isotope use.

Doctors can educate themselves in the techniques involved in isotope use through the reading of detailed published accounts of the results of experiments in laboratories all over the world. Through their associations with hospitals and clinics they have been practicing radioactive diagnostic and therapeutic techniques for many years.

Needed: Personnel

The need today is for trained personnel in industrial research laboratories, both large and small. Because of the opportunities for unlimited research, university chemists and physicists usually tend to stay put, except to go with large corporations at substantial salary increases with equal research opportunities.

Well-paid industrial nuclear engineering personnel can seldom be lured away from lucrative positions by smaller companies. The small business, therefore, must rely on the engineering graduate, of which there are all too few, or do without.

The starting salaries for the graduate accepting a position as a nuclear technician have been estimated at \$5,000 to \$6,000 per year, with advancement strictly a matter of personal accomplishment.

Through its progressive program of help to the school and encouragement to the student, the Atomic Energy Commission is pursuing its "program of conducting, assisting, and fostering research and development in order to encourage maximum scientific and industrial progress" as charged by the Congress in the Atomic Energy Act of 1954.

Science News Letter, August 9, 1958

NUTRITION

Surplus Food, Surplus Fat Problem to U. S. Alone

► A "LUXURY nutrition problem" faces the United States while most other nations have an "essential nutrition problem."

One aspect of our national nutrition problem, a form of malnutrition very different from that facing other nations, is that we have surplus food on the farms and surplus fat on the individual.

The malnourished American eats virtually no breakfast, has a light lunch and gorges on his evening meal.

In much of the world, however, antiquated agricultural practices, lack of technology for transporting and preserving foods, and social and religious customs keep millions more malnourished, Dr. Arnold E. Schaefer of the National Institutes of Health, Bethesda, Md., has said.

Goiter from lack of iodine in the food has been prevalent so long in some areas of the world that it is considered a natural part of the anatomy.

Dr. Schaefer explained that these countries are eager for assistance. Home economists are among the scientists who can continue to contribute greatly to world nutrition improvement programs.

Dr. Schaefer is executive director of NIH's interdepartmental committee on nutrition for national defense.

Science News Letter, August 9, 1958

ASTRONAUTICS

New Space Board Charts Man's Space Penetration

► A SCIENCE SPACE board to survey problems, opportunities, and implications of man's advance into space has been formed by the National Academy of Sciences and the National Research Council.

Under the chairmanship of Dr. Lloyd V. Berkner, president of Associated Universities, committees will be headed by Dr. Harold C. Urey, University of California; Dr. Harrison S. Brown, California Institute of Technology; Dr. Leo Goldberg, University of Michigan; Dr. Donald F. Hornig, Princeton University; Dr. W. A. Noyes, University of Rochester; Dr. R. W. Porter, General Electric Company; Dr. Bruno B. Rossi, Massachusetts Institute of Technology; A. H. Shapley, National Bureau of Standards; Dr. John A. Simpson, University of Chicago; Dr. James A. Van Allen, Iowa State University; Dr. O. G. Villard Jr., Stanford University; Dr. Harry Wexler, U. S. Weather Bureau; Dr. H. Keffer Hartline, Rockefeller Institute for Medical Research; and Dr. S. S. Stevens, Harvard University.

Fields to be explored include: moon and planets, geochemistry of space, radio astronomy, space stations and interplanetary vehicles, international relations, space laboratories and satellites, long-range planning, ionosphere, fields and particles in space, telecommunications, telemetry, guidance, meteorology of space, psychological and biological research, geodesy.

Science News Letter, August 9, 1958

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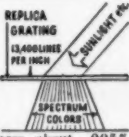


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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ATOMIC ENERGY LEVELS: As Derived from the Analyses of Optical Spectra. Vol. III—Charlotte E. Moore—Govt. Printing Office, Nat. Bureau of Standards Circular 467, 245 p., \$2.50. Covers the elements Molybdenum through Lanthanum, Z-42 through 57; and Hafnium through Actinium, Z-72 through 89.

BASIC AERONAUTICAL SCIENCE AND PRINCIPLES OF FLIGHT—Robert D. Blacker—Am. Technical Society for U. S. Armed Forces Institute under the title AN INTRODUCTION TO GENERAL AERONAUTICS, 243 p., illus., \$5.95. A primer for the prospective pilot.

CHEMICAL ENGINEERING PRACTICE: Vol. 4, Fluid State—Herbert W. Cremer and Trefor Davies, Eds.—Academic, 642 p., \$17.50. Thermodynamics of physical systems.

COASTAL SAND DUNES OF OREGON AND WASHINGTON—William S. Cooper—Geol. Soc. of Am., 169 p., illus., maps, \$3.50. Analyzes the environment, deals with the development of its forms and processes, and describes the history of the dunes.

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SCIENCE AND TECHNOLOGY ACT OF 1958: Analysis and Summary—Senate Committee on Govt. Operations—Govt. Printing Office, 198 p., paper, 45¢. Discusses a bill to create a Department of Science and Technology and related matters.

SCIENCE AND TECHNOLOGY ACT OF 1958: Hearings, Part 1—Subcommittee Reorganization—U. S. Senate Committee on Government Operations, 297 p., paper, free upon request to Committee, Washington 25, D. C.

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Science News Letter, August 9, 1958

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ROENTGENOLOGY

Disputes X-Ray Scare

► ARE DIAGNOSTIC X-RAY examinations dangerous? They are not, according to a Canadian physician.

Roentgen, or X-ray, diagnosis entails only a minute hazard, a risk so small as to be negligible in comparison with the benefits derived, Dr. J. G. Stapleton of Hamilton, Ontario, reports in the *Canadian Medical Association Journal* (July 15).

Admitting there is definitely an element of risk and some statistics establishing X-ray as a cause of leukemia, Dr. Stapleton advises the following steps be heeded:

1. Use added filtration for all fluoroscopic and radiographic tubes to cut the skin dosage received by the patient.

2. Limit the radiation beam to the area in question by means of cones and diaphragms.

3. Use high voltages to boost the dosage while actually using less radiation.

4. Restrict the use of fluoroscopy. Fluoroscopic procedures for the treatment of fractures are hazardous both to the patient and the operator and should be abandoned.

5. Abbreviate examinations of children, particularly with cases that require a follow-up.

6. Shield the gonads of males, particularly those under age 40.

7. Restrict X-ray examination during pregnancy.

8. Abandon the "mass survey" X-ray

examinations of large, healthy population groups.

9. Use the fastest available films and fluorescent screens and active chemicals.

10. Require that all X-ray examinations be done by well-trained technicians under adequate radiological supervision.

Dr. Stapleton re-emphasizes the opinion that X-ray examination can be harmless, depending upon the acceptance by medical science of all the practicable precautionary measures listed.

Science News Letter, August 9, 1958

TECHNOLOGY

New Light Concrete Saves Building Time and Money

► A NEW concrete building material can be sawed, chopped and chiseled without losing its strength, and weighs only one-third as much as ordinary concrete.

The material is expected to enable builders to erect houses 40% faster and at 20% lower cost than with ordinary materials, Gerald Gidwitz, chairman of Continental Materials Corp., Chicago, said.

The light cellular concrete, called Calci-Crete, is said to be easier and cheaper to ship and handle than ordinary concrete.

It is made by blasting air through a wet mixture of concrete, silica, wood and asbestos fibers. After the material "rises," much like bread, it is molded, baked, sawed to size and polished.

Science News Letter, August 9, 1958

AGRICULTURE

Weeds May Not Grow Without Hoeing

See Front Cover

► SOME MINOR experiments conducted at the U. S. Department of Agriculture's plant physiology laboratory at Beltsville, Md., point to the importance of cultivation in getting plants to grow.

Weed seeds were planted in six small flower pots. They were covered with a very thin layer of soil and watered from the bottom so as to leave the surface undisturbed. In some of the pots scientists cut through the soil with a knife. Wherever the knife marks were made, weeds began to grow.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the pots and the weeds growing along the cut lines. Seeds in pots left untouched remained dormant.

By cutting through the soil, the scientists explain, the seeds were exposed to the light. Without light and darkness in the right proportions, seeds will not germinate.

These experiments with weeds are a small part of the laboratory's extensive basic research program centered around the importance of light to plants. The staff, headed by Dr. H. A. Borthwick, is investigating the reversible photochemical reactions involved in seed germination, flowering and related processes.

Science News Letter, August 9, 1958

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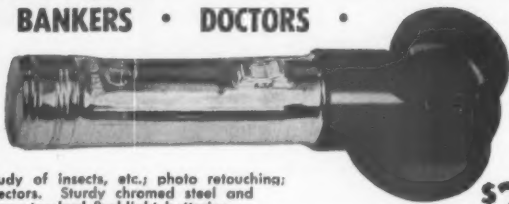
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Questions

ARCHAEOLOGY—What is one of the reasons for the fall of the Sumer Government thousands of years ago? p. 84.

ENGINEERING—What is a homopolar device? p. 83.

EVOLUTION—What is the importance of central fusion of chromosomes? p. 86.

NATURAL RESOURCES—What is the only known vegetable source of vitamin B-12? p. 87.

TECHNOLOGY—How does the "baby" reactor being offered to colleges differ from the "critical" reactor? p. 90.

Photographs: Cover, Fremont Davis; p. 83, General Electric Company; p. 85, Boeing Airplane Company; p. 87, University of Wisconsin; p. 90, Nuclear-Chicago Corporation; p. 96, W. R. Grace and Company.

MEDICINE

"Live" Polio Vaccine Aids In Congo Epidemic Area

▶A LIVE VIRUS polio vaccine that can be administered orally by tablespoon is reported to be highly effective, according to preliminary reports.

A total of 244,596 inhabitants of the Belgian Congo and Ruanda-Urundi, including both sexes and all ages, received the "live" vaccination containing the Chat strain type 1 polio virus by oral administration. Of these, 2,511 also received the Fox III strain of type 3 virus. No sickness or side effects were reported after the vaccinations, five doctors report in the *British Medical Journal* (July 26).

It had been estimated previous to vaccination that 12% of the tested population had no antibodies to fight the type 1 virus prior to the vaccination.

When four epidemic outbreaks of poliomyelitis occurred in the Belgian Congo, the World Health Organization recommended the administration of the live Chat type 1 virus. After the vaccination no more cases of paralysis were reported in the four localities involved in the outbreaks, the doctors report.

The vaccine has been administered in capsule form. The liquid can be squirted into the mouth by a pipette, or simply poured into a tablespoon and swallowed as any other liquid medicine.

One of the doctors, Hilary Koprowski, director of the Wistar Institute, Philadelphia, previously reported the successful administration of an oral live vaccine to 600 persons in the United States. Dr. Herald R. Cox worked with Dr. Koprowski when he was assistant director of virus and rickettsial research at Lederle Laboratories, Pearl River, N. Y., where the vaccine was developed.

In addition to Dr. Koprowski, Drs. G. Courtois, director of Laboratoire Medical, Stanleyville, Belgian Congo, A. Flack, medical director, Clinton Farms, Clinton, N. J., G. A. Jervis, director of laboratories, Letchworth Village, Thiels, N. Y., and G. Ninane, also of Laboratoire Medical at Stanleyville, assisted in this latest vaccination program in Africa.

Science News Letter, August 9, 1958

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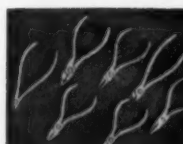


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• New Machines and Gadgets •

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✿ **ACID PUMP** provides contaminant-free handling of corrosives. The polyethylene pump screws onto any standard five-pint acid bottle. Attached to it are a siphon, a spout and a four-ounce squeeze bottle, all of plastic.

Science News Letter, August 9, 1958

✿ **TELEPHONE LOCK** prevents unauthorized outgoing calls. The lock is mounted on a circular rim that completely blocks out the dial holes. Two keys are provided with each telephone lock.

Science News Letter, August 9, 1958

✿ **ADJUSTABLE BACK-REST** for automobile drivers is said to be able to fit individual height and figure types. The adjustments are made with three knobs; two that modify the sitting height and a third for firmness and curve. The back-rest is made of fiber glass mesh fastened to a steel frame.

Science News Letter, August 9, 1958

✿ **SAFE BASEBALL** for junior and his friends is made possible by a lightweight plastic bat and a matched one-ounce plastic ball, shown in the photograph. The 30-inch bat is hollow and of regulation shape. The ball is hollow too, and has surface holes to



limit its path of flight. Made of a polyethylene plastic, the bat and ball help prepare future big leaguers.

Science News Letter, August 9, 1958

✿ **DOLL PAINTING KIT** permits youngsters to paint the native costumes of dolls

of 32 nations. Five different colors of paint, thinner, and glue for mounting the dolls to bases contained in the kit are housed in non-breakable polyethylene plastic containers.

Science News Letter, August 9, 1958

✿ **SAFETY TAGS** are designed for permanent marking of emergency shut-offs in the home. The tags are marked in red to state, for example, "Main Water Shut-Off." Accompanying the tags are nickel-plated bead chain fasteners.

Science News Letter, August 9, 1958

✿ **SOLAR BROILER** can be used to sun-broil meat in the back yard or on a picnic. The fireless cooker weighs four pounds and folds up like an umbrella. The aluminized inside of the broiler forms a four-foot parabolic reflector that focuses the sun's rays on a ten-inch grill.

Science News Letter, August 9, 1958

✿ **POWER SAW KIT** is designed for the do-it-yourselfer. It contains an electric power saw, a circle-cutting and rip-saw attachment, and five assorted blades. The saw operates on 110-120 volt alternating or direct current. The kit is housed in a metal carrying case.

Science News Letter, August 9, 1958



Nature Ramblings



By HORACE LOFTIN

➤ A SPECIAL CHARM of flowers to man is the great variety in which they come. Their colors encompass the rainbow. Their form and structure range from very simple to extraordinarily complex. The arrangement of petals and other parts, their size and showiness or delicate minuteness, all add to the floral kaleidoscope.

This almost infinite variety represents the product of natural selection during more than 150,000,000 years, since the Mesozoic Era when true flowering plants first appeared. Floral features which gave superiority to the plant were retained, improved and elaborated on through the thousands of centuries.

Each species' unique flowers are vital to the survival of the plant.

Flowers are sexual organs. Survival of the species depends upon how well the flowers carry out their reproductive func-

Flowers for Survival



tion. This hinges upon how successfully the pollen of one flower is carried to another flower to fertilize the eggs.

In some plants, pollen is normally distributed by wind or water from one flower to another, and in this case the floral structure is extremely simple. There is little need for showy petals and bright color, and these are usually lacking.

But in many of our familiar flowers, cross

pollination requires the services of an insect, bird or animal, carrying a load of pollen from one blossom to another.

Many of our flowers depend on bees for cross pollination. Their floral parts are developed to attract bees. Especially interesting is the fact that these "bee flowers" tend to be blue or yellow or a mixture of the two. This is consistent with the finding that bees see these colors best and are color-blind to reds. The typical blue violet is a "bee flower."

Flowers normally cross-pollinated by butterflies are commonly red or orange, corresponding to the butterfly's range of color vision. "Moth flowers" are often white and highly scented, since the night-flying moths are guided to them more by smell than by vision.

When man uses "artificial selection" of special floral characteristics to suit his own tastes we find flower features that do not serve in the struggle for survival.

Science News Letter, August 9, 1958

